

WHAT IS CLAIMED IS:

[C001] 1. An omnidirectional eddy current probe comprising:

a plurality of sense coils arranged in a stack having a principal axis, wherein at least two of said sense coils are rotationally skewed about the principal axis relative to one another;

electrical connections operatively connecting said sense coils; and

a drive coil positioned in the stack.

[C002] 2. The omnidirectional eddy current probe of claim 1, wherein said sense coils are electrically insulated from each other.

[C003] 3. The omnidirectional eddy current probe of claim 2 further comprising at least one substrate positioned between a pair of said sense coils, said substrate electrically insulating the pair of said sense coils.

[C004] 4. The omnidirectional eddy current probe of Claim 3, wherein said at least one substrate is flexible.

[C005] 5. The omnidirectional eddy current probe of claim 4, wherein at least one of said sense coils in the pair is formed on said at least one substrate.

[C006] 6. The omnidirectional eddy current probe of Claim 5, wherein two of said sense coils are formed on said at least one substrate.

[C007] 7. The omnidirectional eddy current probe of Claim 3, comprising a plurality of substrates, said substrates being stacked.

[C008] 8. The omnidirectional eddy current probe of Claim 7, wherein said substrates are bonded to maintain alignment of the stack.

[C009] 9. The omnidirectional eddy current probe of Claim 1, wherein at least two of said sense coils have a common geometry.

[C010] 10. The omnidirectional eddy current probe of Claim 1, wherein at least two of said sense coils have a different geometry.

[C011] 11. The omnidirectional eddy current probe of Claim 1, wherein said drive coil is one of said sense coils.

[C012] 12. The omnidirectional eddy current probe of Claim 1, wherein said drive coil (120) is not one of said sense coils.

[C013] 13. An omnidirectional eddy current array probe comprising:

a plurality of sense coils arranged in a plurality of stacks, each of the stacks having a principal axis, wherein at least two of said sense coils in the stack are rotationally skewed about the respective principal axis;

a plurality of electrical connections operatively connecting said sense coils within the respective stacks; and

a plurality of drive coils, each of said drive coils being positioned in a respective one of said stacks.

[C014] 14. The omnidirectional eddy current array probe of claim 13 further comprising at least one substrate positioned between at least one pair of said sense coils in each of the stacks, said substrate electrically insulating said at least one pair of said sense coils.

**[C015]** 15. The omnidirectional eddy current array probe of Claim 14, wherein said at least one substrate is flexible.

**[C016]** 16. The omnidirectional eddy current array probe of Claim 14, comprising a plurality of substrates arranged in a global stack, each of said substrates being positioned between a respective pair of said sense coils in each of the stacks.

**[C017]** 17. The omnidirectional eddy current array probe of Claim 13, wherein at least two of said sense coils within a respective one of said stacks have a common geometry.

**[C018]** 18. The omnidirectional eddy current array probe of Claim 13, wherein at least two of said sense coils within a respective one of said stacks have a different geometry.

**[C019]** 19. The omnidirectional eddy current array probe of Claim 13, wherein at least two of said stacks have a common geometry.

**[C020]** 20. The omnidirectional eddy current array probe of Claim 13, wherein at least two of said stacks have a different geometry.

**[C021]** 21. The omnidirectional eddy current array probe of Claim 13, wherein a corresponding sense coil of each stack defines a level, and at least two of said sense coils in a respective one of the levels have a common geometry.

**[C022]** 22. The omnidirectional eddy current array probe of Claim 13, wherein none of said drive coils is one of said sense coils.

**[C023]** 23. The omnidirectional eddy current array probe of Claim 13, wherein at least one of said drive coils is one of said sense coils.

**[C024]** 24. The omnidirectional eddy current array probe of Claim 16, wherein a center of one of said sense coils is offset with respect to a center of another of said

sense coils within the respective stack, resulting in a staggered arrangement of said sense coils.

**[C025]**        25. An omnidirectional eddy current inspection system comprising:  
an eddy current probe comprising:

        a plurality of sense coils arranged in a stack having a principal axis,  
wherein at least two of said sense coils are rotationally skewed about the principal  
axis relative to one another,

        a drive coil positioned in the stack, and  
        a plurality of electrical connections connecting said sense coils; and  
an eddy current instrument connected to said probe.

**[C026]**        26. The omnidirectional eddy current inspection system of Claim 25,  
wherein each of said sense coils is individually monitored by said eddy current  
instrument.

**[C027]**        27. The omnidirectional eddy current inspection system of Claim 25,  
wherein said sense coils are monitored simultaneously through a single channel by  
said eddy current instrument.

**[C028]**        28. An omnidirectional eddy current inspection system comprising:  
an eddy current array probe comprising:

        a plurality of sense coils arranged in a plurality of stacks, each of the  
stacks having a principal axis, wherein at least two of said sense coils in a respective  
one of the stacks are rotationally skewed about the respective principal axis,

a plurality of drive coils, each of said drive coils being positioned in a respective one of said stacks, and

a plurality of electrical connections connecting said sense coils; and

an eddy current instrument connected to said probe.

**[C029]** 29. The omnidirectional eddy current inspection system of Claim 28, wherein each of said sense coils in said probe is individually monitored by said eddy current instrument.

**[C030]** 30. The omnidirectional eddy current inspection system of Claim 28, wherein each of said sense coils within a respective one of said stacks is monitored simultaneously through a single channel by said eddy current instrument.